

# NASA TECH BRIEF

*Ames Research Center*



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## Moisture-Resistant Baffle Material for Fuel Tanks

Polyurethane-foam baffle material is used in aircraft fuel tanks to prevent sloshing of fuel, to reduce fire hazards by inhibiting flame propagation, and to reduce the rate of spillage in the event of leakage or ballistic impact. Currently, a polyester-based polyurethane is used because pores in the foam structure can be enlarged to an optimum and controlled size by an alkaline hydrolytic etch. Unfortunately, the foams currently in use undergo a progressive hydrolytic deterioration; depending on the environment, the aircraft wings must be opened to replace the foam barriers within 1 to 3 years.

Many varieties of polymeric products were investigated in attempts to find a protective coating for the baffle material. In general, candidate coatings were applied to foam tensile specimens in amounts which increased specimen weight by 40 to 50 percent or more; coated specimens were placed in a hot, humid environment (86°C, 93% R.H.) and tested for breaking strengths at intervals from 3 to 20 days. The results of the tests (and other physical and mechanical

property measurements) indicated the superiority of certain polyether-based polyurethanes as protective coatings and suggested that baffle materials with one of these coatings should have a useful life approximately twice that of the uncoated foams now in use.

### **Note:**

Requests for further information may be directed to:

Technology Utilization Officer  
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Moffett Field, California 94035  
Reference: TSP 74-10219

### **Patent status:**

NASA has decided not to apply for a patent.

Source: Norman Bilow of  
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